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THE CASTLE AND TOWN OF TAUNTON.

TAUNTON CASTLE.

TAUNTON in Somersetshire, is 140 miles west of London, and is supposed to take its name from the river Thone, or Tone, on which it stands; but it has been spelt at different times Tantun, Tawnton, and Thonton. It is beautifully situated in a large and fertile vale, called *Taunton Dean*, which is enclosed on all sides by ridges of hills, and remarkable for the richness of its soil and the mildness of its climate. The town is not mentioned in the Roman Itineraries, but, from the immense number of Roman coins and medals found in the neighbourhood, it is thought that a Roman legion was stationed in or near it. In 1666, two large urns were dug up, full of coins of various emperors, and weighing, with their contents, about eighty pounds each; and in 1643, various Roman antiquities were discovered in the foundations of an old house, near Taunton Castle, among which was a medal of Vespasian celebrating the conquest of Judæa. There is a village near this place, called *Conquest*, which, it is supposed by some, owes its name to the conquest gained there by the Romans over the *Cangi*, or ancient inhabitants of Somersetshire; but the more general opinion is, that it is the spot where a signal victory was gained over the Danes by Alfred.

Taunton was a place of great importance in the Saxon times. It was the royal residence of some of the west Saxon kings, especially of their lawgiver, Ina, who built the first castle here, in the year 700, and held in it the great council of his kingdom. This castle was probably of wood, and having served as a royal residence and strong-hold for twenty-one years, during which time it sustained several sieges, it was pulled down, after the various seditions against Ina had been quelled, and peace restored to the kingdom. Another castle, however, was built, about the time of the Conquest, by Walkelin, bishop of Winchester, and enlarged by his successor, William Gifford. A part of this structure still remains, on the west side of the town, but the Assize-hall was built by Bishop Horne, in 1577. The building was also repaired, and the present gateway built, by Bishop Langton, in 1495. His successors sometimes resided in the castle, and the courts of the bishop of Winchester are still held there.

The access to the castle from the town is through an open court, called *Castle-green*, where, formerly, the dead were buried in the time of war. It was enclosed with gates: that on the west has been destroyed, but the gateway on the east, called the *Porter's lodge*, has been converted into a modern dwelling-house. The arches are very strong, and the grooves, in which the portcullis was let down, are quite perfect.

This edifice had fallen into such a ruinous state, in 1785, that the assizes were on the point of being removed to another place, when a sum of money was raised for the repair of the building, partly by a subscription of some of the inhabitants, but principally by the representatives of the borough. Thus the assize-hall was repaired, a new grand-jury-room built,

and the courts rendered fit for the sessions and assizes. Similar measures were again found necessary in 1816.

The Castle of Taunton was once considered the key of the west of England; and hence it was the scene of many skirmishes during the Civil Wars, in the reigns of Henry the Seventh, Charles the First, and James the Second.

The war of Henry the Seventh with Scotland afforded him a pretext for raising a subsidy of 120,000*l.* from his subjects. This proceeding caused great discontent among the inhabitants of Penryn, in Cornwall, who rose up against the authorized receiver of the tax. He retired into the castle of Taunton, whither they followed, and killed him; they then advanced as far as Wells, and were joined by a nobleman, named Lord Audley. Under this new chief, (their former leader was a blacksmith,) they advanced through Salisbury towards the neighbourhood of London, where they were defeated by the king's troops, and their leaders executed.

The Cornishmen next invited for a leader the famous Perkin Warbeck, who accordingly came from Ireland, and assumed the title of Richard the Fourth. Having gathered together an army, he attempted to storm the city of Exeter, but failed. He then came to Taunton, took its castle on the 20th of September, 1497, and caused great consternation. On the approach of danger, however, his men forsook him, and he was obliged to fly, and take sanctuary in an abbey, near Southampton, to the great joy of the inhabitants of Taunton, which was expected to be the scene of a dreadful combat, the king having advanced towards it with a large army.

This town took part in the civil wars of the latter part of the reign of Charles the First, and was so distinguished by its steady adherence to the cause of the parliament, as to gain to itself the name of "the Saguntum of the parliament;" alluding to the city of Saguntum in Spain, which was so firmly and so faithfully devoted to the cause of Rome, but was at length destroyed by Hannibal. Taunton was at that time considered a place of such strength and importance, that the parliamentary forces took care to secure it as early as possible. They therefore entered it in August, 1642, under Sir William Waller, and were assisted in their proceedings by the mayor and principal inhabitants, and the trained bands of the town and neighbourhood. Upon searching suspected houses in Taunton and the neighbouring towns, they discovered great stores of ammunition, arms, and money, which they accordingly lodged in the castle.

In the next year, however, both the town and castle were taken by the royalists, under the Marquess of Hertford, who drove out the parliament forces. In the following year it was again taken for the parliament, by Colonel Blake, in whose hands it remained till the end of the civil war. The king, however, made several vigorous efforts to recover it; as in 1644, when it was besieged, but without effect, by a royal army, of three thousand men. In the following spring, also, a body of ten thousand of the royal forces, under Lord Goring, lay before Taunton for fifty-four days, and the inhabitants were very nearly starved out, when the parliament sent to their relief a large army, commanded by Sir Thomas Fairfax. The number which actually came to the relief of the town was by no means strong enough to cope with Lord Goring's army, for the main body of Fairfax's force was sent to another part; Lord Goring, however, thinking that the whole force was approaching, fled with his troops in disorder, just as General Fairfax had arrived, leaving the inhabitants of Taunton so delighted at their deliverance, that the 11th of May, on which day it happened, was celebrated annually, for several years afterwards, with appropriate thanksgivings. During this memorable siege, a great part of the town was reduced to ashes by the shells of the besiegers, and several fine buildings were destroyed.

When Charles the Second came to the throne, the proceedings at Taunton were not forgotten; and the town underwent a severe punishment, by being stripped of its walls, which were so completely rased, that at present their site is not known. The corporation was also deprived of its charter, but this was afterwards restored.

After the death of Charles, the inhabitants of this town were zealously attached to the Duke of Monmouth, and greatly assisted him in his endeavours to dethrone James the Second. He was heartily welcomed at Taunton, where he was, for the first time, proclaimed king, and collected together the greater part of his army.

After his defeat at the battle of Sedgemoor, and his trial and execution, the inhabitants of Somersetshire and the neighbouring counties paid dearly for their disloyal conduct, for hundreds were condemned to death by the inhuman Judge Jeffreys, at what has been appropriately termed his "bloody assizes." He opened his commission in the great hall of the castle, which he ordered to be hung with red cloth, as a token of vengeance. Here, we are told, he sat, either constantly drunk, or in the most outrageous passion, uttering foul language, and showing neither pity nor mercy. He was surrounded by the detestable Kirke and his soldiers. Kirke's regiment, which is now the second foot, was then called the Tangier regiment, from having been in garrison at Tangier, in the north of Africa, which fortress had been given to Charles the Second, as a marriage-portion with his consort. This regiment was cantoned during the trial of the prisoners, on a piece of ground on the west side of Castle-green, adjoining the assize-hall, which yet bears the name of "Tangier," in memory of these transactions. The soldiers, the agents of his cruelties, were called by him his "lambs." The origin of this appellation is to be referred to the device of the Paschal lamb, which still exists on the colours of the second regiment of foot.

After the accession of William the Third, Taunton ceased to be so intimately connected, as it had previously been, with the general history of the country. At present its population is about twelve thousand, but we are told that it is still increasing. The principal manufacture is that of silk, in which about eighteen hundred hands are employed. This art was first introduced into the town in 1778, and is carried on very successfully. Formerly there was also a considerable woollen manufacture, but it has gradually declined, and at present there are scarcely any looms in the town. The woollen manufacture was introduced as early as 1336, and continued increasing till the beginning of the last century, at which time we find that 8500 persons were employed in it, the Taunton serges being then very celebrated.

The principal public building in the town of Taunton is the parish-church of St. Mary Magdalen. It is a large oblong building, divided into five aisles—a species of grandeur which, though common in the large French churches, is seldom met with in England. In this case, however, it appears that the original structure consisted of the three central aisles only, and that the two outer ones, together with the south porch, were a subsequent addition, in the year 1508, or about the time when the pointed style assumed

that excessive richness and exuberance of ornament which immediately preceded its fall.

The most remarkable and justly-celebrated part of this church is its beautiful tower, which is attached to the west end, so that its lower part forms a vestibule to the church. This tower is commonly supposed to have been added at the same time as the outer aisles and south porch; but its style is earlier and more elegant. It is very probably a monument of the taste and munificence of the celebrated William of Wykeham*; for it bears a great resemblance to his other splendid architectural works, which are all remarkable for the chasteness of their ornament, and the elegance of their proportions, which have never been improved upon.

The only other church is that of St. James, which is very inferior to St. Mary Magdalen's in size and beauty, but resembling it in the arrangement of its parts. It has a fine ancient font, and a good organ, and likewise a tower at the west end. This was the conventual church of an ancient priory, built by William Gifford, bishop of Winchester, in 1127, and greatly enlarged by many of his successors, especially his immediate successor, Henry de Blois, brother of King Stephen. It shared the common fate, however, at the dissolution of religious houses by Henry the Eighth, and only the abbey-church was left. This church of St. James has lately been much enlarged and improved.

The Taunton and Somerset hospital owes its origin to the celebration of the Jubilee on the 25th of October, 1809, the day on which George the Third entered the fiftieth year of his reign.

There are two *endowed* alms-houses in Taunton. One was founded in 1635 by Mr. Gray, a merchant of London, who also left money to many other charities. The other was founded by Richard Huish, Esq., for the relief of thirteen infirm, but honest men, one of whom is president or reader.

Taunton still returns two members to parliament. It received a charter of incorporation in the reign of Charles the First, in 1627, which charter it lost a second time, in the year 1792. The efforts of the inhabitants to revive the corporation, during the regency of George the Fourth, were not attended with success.

* See *Saturday Magazine*, Vol. IV., p. 115.

We look with wonder at the transformations that take place in insects, and yet their physical metamorphoses are not greater than the changes which we ourselves undergo, morally and intellectually, both in our relations to others and in our individual nature.—*The Doctor.*

The admirable harmony established by the Creator between the various constituent parts of the animal frame, renders it impossible to pay regard to or infringe the conditions required for the health of any one, without all the rest participating in the benefit or injury. Thus, while cheerful exercise in the open air, and in the society of equals, is directly and eminently conducive to the well-being of the muscular system, the advantage does not stop there; the beneficent Creator having kindly so ordered it, that the same exercise shall be scarcely less advantageous to the proper performance of the important function of respiration. Active exercise calls the lungs into play, favours their expansion, promotes the circulation of the blood through their substance, and leads to their complete and healthy developement. The same end is greatly facilitated by that free and vigorous exercise of the voice, which so uniformly accompanies and enlivens the sports of the young, and which doubles the benefits derived from them considered as exercise. The excitement of the social and moral feelings among children engaged in play is another powerful tonic, the influence of which on the general health ought not to be overlooked; for the nervous influence is as indispensable to the right performance of respiration, as it is to the action of the muscles or to the digestion of food.—Combe.

A FRAGMENT ON BEARDS.

There was a poor fellow among John Wesley's followers, who suffered no razor to approach his chin, and thought it impossible that any one could be saved who did: shaving was in his opinion a sin for which there could be no redemption. If it had been convenient for their interests to put him out of the way, his next of kin would have had no difficulty in obtaining a *lettre de cachet* against him from a mad doctor, and he might have been imprisoned for life, for this harmless madness. This person came one day to Mr. Wesley, after sermon, and said to him in a manner which manifested great concern, "Sir, you can have no place in heaven without a beard! therefore, I entreat you, let yours grow immediately!"

Had he put the matter to Wesley as a case of conscience, and asked that great economist of time how he could allow himself every day of his life to bestow nine precious minutes upon the needless operation of shaving, the patriarch of the Methodists might have been struck by the appeal, but he would soon have perceived that it could not be supported by any just reasoning.

For in the first place, in a life of such incessant activity as his, the time which Wesley employed in shaving himself was so much time for reflection. However busy he might be, as he always was,—however hurried he might be on that particular day, here was a portion of time, small indeed, but still a distinct and apprehensible portion, in which he could call his thoughts to council. He was a person who knew this, and he profited by it, as well knowing what such minutes of reflection are worth. For although thought cometh like the wind, when it listeth, yet it listeth to come at regular appointed times, when the mind is in a state of preparation for it, and the mind will be brought into that state, unconsciously, by habit. We may be as ready for meditation at a certain hour, as we are for dinner, or for sleep; and there will be just as little need for an effort of volition on our part.

Secondly, Mr. Wesley would have considered that if beards were to be worn, some care, and consequently some time, must be bestowed upon them. The beard must be trimmed occasionally, if you would not have it as ragged as an old Jew clothes-man's: it must also be kept clean, if you would not have it inhabited like the emperor Julian's; and if you desired to have it like Aaron's, you would oil it. Therefore it is probable that a Zebedeean, who is cleanly in his habits, would not save any time by letting his beard grow.

But it is certain that the practice of shaving must save time for fashionable men, though it must be admitted that these are persons whose time is not worth saving, who are not likely to make any better use of it, and who are always glad when any plea can be invented for throwing away a portion of what hangs so heavily upon their hands.

> Alas, Sir, what is a Gentleman's time!
> ——— there are some brains
> Can never loose their time, whate'er they do.

For in former times as much pains were bestowed on dressing the beard, as in latter ones upon dressing the hair. Sometimes it was braided with threads of gold. It was dyed to all colours, according to the mode, and cut to all shapes, as you may learn from John Taylor's *Superbiæ Flagellum.*

> Now a few lines to paper I will put,
> Of men's beards strange and variable cut:
> In which there's some do take as vain a pride,
> As almost in all other things beside.
> Some are reaped most substantial like a brush,
> Which make a natural wit known by the bush:

(And in my time, of some men I have heard,
Whose wisdom hath been only wealth and beard.)
Many of these the proverb well doth fit,
Which says Bush natural, more hair than wit.
Some seem as they were starched stiff and fine,
Like to the bristles of some angry swine:
And some (to set their love's desire on edge)
Are cut and pruned like to a quickset hedge.
Some like a spade, some like a fork, some square,
Some round, some mowed like stubble, some stark bare,
Some sharp stiletto fashion, dagger like,
That may with whispering a man's eyes out pike;
Some with the hammer cut, or Roman T,
Their beards extravagant reformed must be;
Some with the quadrate, some triangle fashion,
Some circular, some oval in translation,
Some perpendicular in longitude,
Some like a thicket for their crassitude,
That heights, depths, breadths, triform, square, oval, round,
And rules geometrical in beards are found;
Beside the upper lip's strange variation,
Corrected from mutation to mutation;
As't were from tithing unto tithing sent,
Pride gives to *Pride* continual punishment.
Some (*spite their teeth*) like thatched eaves downward grows,
And some grow upwards in despite their nose.
Some their mustachios of such length do keep,
That very well they may a manger sweep!
Which in Beer, Ale, or Wine, they drinking plunge,
And suck the liquor up as 't were a sponge;
But 'tis a sloven's beastly *Pride* I think
To wash his beard when other men must drink.
And some (because they will not rob the cup)
Their upper chaps like pot hooks are turned up,
The Barbers thus (like Tailors) still must be,
Acquainted with each cut's variety.

In comparison with such fashions, clean shaving is clear gain of time.—*The Doctor.*

WHILE upon the Bonin islands, searching for shells on the rocks, I was much astonished at seeing at my feet a most extraordinary-looking animal, crawling towards the surf, which had only just left it. I had never seen one like it under such circumstances before. It was creeping on its eight legs, which from their soft and flexible nature, bent considerably under the weight of its body, so that it was lifted by the efforts of its tentacula only a small distance from the rocks. It appeared much alarmed at seeing me, and made every effort to escape, while I was not much in the humour to endeavour to capture so ugly a customer, whose appearance excited a feeling of disgust, not unmixed with fear. I however, endeavoured to prevent its career, by pressing one of its legs with my foot; but although I made use of considerable force for that purpose, its strength was so great that it several times quickly liberated its member, in spite of all the efforts I could employ in this way on wet, slippery rocks. I now laid hold of one of the tentacles with my hand, and held it firmly, so that the limb appeared as if it would be torn asunder by our united strength. I soon gave it a powerful jerk, wishing to disengage it from the rocks to which it clung so forcibly by its suckers, which it effectually resisted; but the moment after, the apparently enraged animal lifted its head with its large eyes projecting from the middle of its body, and letting go its hold of the rocks, suddenly sprang upon my arm, which I had previously bared to my shoulder, for the purpose of thrusting it into holes in the rocks to discover shells, and clung with its suckers to it with great power, endeavouring to get its beak, which I could now see, in a position to bite!

A sensation of horror pervaded my whole frame when I found this monstrous animal had affixed itself so firmly upon my arm. Its cold slimy grasp was extremely sickening; and I immediately called aloud to the captain, who was also searching for shells at some distance, to come and release me from my disgusting assailant. He quickly arrived, and taking me down to the boat, during which time I was employed in keeping the beak away from my hand, quickly released me by destroying my tormentor with the boat-knife, when I disengaged it by portions at a time. This animal must have measured across its expanded arms about four feet, while its body was not larger than a large clenched hand. It was that species of sepia* which is called by whalers *rock-squid*.—BEALE.

* See *Saturday Magazine*, Vol. XV., p. 11.

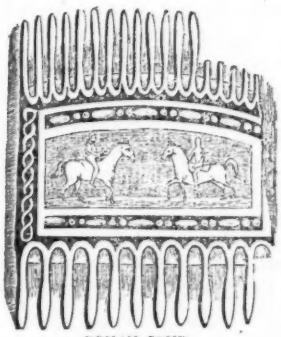
MATERIALS FOR THE TOILETTE.

No. V.

ON COMBS.

ANGLO-SAXON LADY DRESSING HER HAIR.

THE *Comb* appears to have been used by ladies, as a decoration for the hair, from a very early period; although it seems probable that at many intervening periods the influence of fashion has tended to bring it into disuse. Some of the Greek tombs which have been opened, have been found to contain, among other implements, combs made of box-wood. Montfaucon gives a representation of an ancient comb by no means deficient in elegance. It is apparently of box-wood or ivory; very broad, but short; with long teeth, those on one side being larger than those on the other; and the solid middle was studded or carved with bas-reliefs. In a work written by Guasco, on ornaments, are several representations of ancient Roman combs; one in particular, which was in the Museum Lettala, at Milan, was a long one of box, of which the handle was overlaid with ivory, and appears to have been ornamented with a small meander or filigree in gold: it had two rows of fine teeth, delicately wrought and well proportioned.



ROMAN COMB.

Some of the ancient Britons were found to possess combs; we have copied, at the head of this paper, an old representation of an Anglo-Saxon lady, with a looking-glass in one hand, and a comb in the other, in which the comb is seen to have a double row of teeth. The early Germans are said to have had combs made of "horse tail:" we presume this must mean the stiff horse-hairs. Combs of the thirteenth century have been found, set with jewels; and in a more humble form, combs have been met with formed of the teeth of fish, set in bone.

The comb-makers of Paris were at one period a body of some consideration in a manufacturing point of view. They formed a company which had laws and bye-laws so early as the year 1507. Henry the

Third confirmed the privileges of the company by letters patent in 1578; and Henri Quatre did the same in 1600. Louis the Fourteenth, in 1691, confirmed them, adding at the same time some new clauses respecting the rights of apprentices, &c.

Combs are, as is well known, made of various substances, of which, however, the principal are *tortoiseshell* and *horn*. We will therefore give a brief account of these substances, and of the mode of preparing them.

Tortoiseshell is the scale or covering of the testaceous animal called a tortoise. The whole covering is not properly shell, for it is, through the greater part of its thickness, of a perfect bony contexture; and it is only on the outside that it is covered with scales, or rather plates, of a horny substance, which is what the workmen call tortoiseshell.

There are different species of the tortoise; but it is only that one called the *testudo imbrecata*, which yields shell fit for ornamental uses. The lamellæ, or plates of the shell of this species, are stronger, thicker, and clearer, than those of any other kind, and constitute the sole value of the animal. They are semi-transparent, and elegantly variegated with whitish, yellowish, reddish, and dark-brown clouds and undulations, so as to constitute, when properly prepared and polished, one of the most elegant articles for ornamental purposes. These lamellæ form the external coating, and this is raised or separated from the bony part, which it covers, by placing fire beneath the shell; the heat soon causing the plate to start, so as to be easily detached from the bone. These plates vary in thickness, according to the age and size of the animal, and measure from an eighth to a quarter of an inch in thickness. A large turtle is said to afford about eight pounds of tortoiseshell; or, according to M. Schoepf, from five to fifteen pounds; and unless the animal itself be about the weight of 150 pounds, the shell is not worth much.

In order to bring tortoiseshell into the particular form required on the part of the artist, (says Dr. Shaw in his *General Zoology*,) it is steeped in boiling water, till it has acquired a proper degree of softness, and immediately afterwards committed to the pressure of a strong metallic mould of the figure required; and where it is necessary that pieces should be joined so as to compose a surface of considerable extent, the edges of the respective pieces are first scraped or thinned, and being laid over each other during their heated state, are committed to a strong press, by which means they are effectually joined or agglutinated.

The common *horn* combs are made from the substance of the horn of the bullock. The bullock's horns are prepared for being manufactured into combs by the tips being sawn off, after which they are held in the flame of a wood fire, till they become nearly as soft as leather. In this state they are split open on one side, and pressed in a machine between two iron plates, then plunged into a trough of water, whence they come out hard and flat. When the horn is cut to the size intended for the required combs, several pieces are laid upon a pair of tongs, adapted to the business, over a fire made chiefly of joiner's shavings, to soften them. They are frequently turned, and when sufficiently soft, are put into a vice and screwed tight, to complete the flattening. When this process is finished, the horns are perfectly flat and hard; they are then given to a man who shaves, planes, or scrapes off the rough parts with a knife, similar in shape to one used by coopers, having two handles, which the comb-maker works from him, across the grain of the horn, from one end of the intended comb to the other. When both sides are perfectly smooth, it is delivered to the person who cuts the teeth.

Ivory is frequently used as a material for combs. That species which is imported from Ceylon is preferred, as being less liable to turn yellow by exposure to the atmosphere. The whiteness which ivory acquires, depends chiefly on the degree of dryness which it has attained. When yellow, its gelatinous matter is altered by the air, and appears combined with the oxygen of the atmosphere. Heat is insufficient for making ivory pliant, though it is rendered softer by being exposed to heat. The ivory is cut into thin slices by means of a saw; and for very delicate work the operation is sometimes performed under water, to prevent the ivory from being heated or rent by the action of the tool. It is polished with pummice-stone and tripoli.

These, then, are the modes in which the principal substances, of which combs are made, are prepared for the operation of cutting the teeth in them. This process we need not here describe: by referring to the *Saturday Magazine*, vol. xiii., p. 224, the reader will find details sufficiently minute for the comprehension of the subject. But those details relate merely to the operation of cutting the teeth, and do not speak of the general form given to the comb. These forms are often exceedingly elegant, the comb being curved in a graceful manner. Its surface also is often embossed with figures in relief, not only formed of ornaments of pearl, &c., affixed to the comb, but the substance of the comb itself is raised in ornamental relief. This is in most cases effected by pressure combined with heat, and merits a short notice from us.

In order to press horn or tortoiseshell into any given form, it is first placed in hot water until it becomes sufficiently softened. It is then put into moulds of iron or brass, made in two or more pieces, and with cavities between them to correspond with the article which is to be fabricated, and with all its intended ornaments engraved in the interior surface of the mould. This mould being made hot, the horn or shell is put between its two halves, and the mould being put in a small screw-press, the halves are forced together, to imprint the horn, and press it into the cavity of the mould. But if the article has any considerable relief, this cannot be done at one heating, and therefore the press, with the moulds in it, is put into a copper and boiled still longer; it is then taken out, and by a lever applied to the screw, it is screwed tighter, so as at length to obtain the impression desired. This description applies to a large variety of articles manufactured in horn or tortoiseshell.

The costliness of tortoiseshell has led to many different attempts to stain common horn so as to imitate the variegated appearance of tortoiseshell. One of the methods of obtaining this effect is thus described:—the horn to be dyed, being first pressed into a flat form, is to be spread over with a kind of paste made of two parts of quicklime and one of litharge, brought into a proper degree of consistency with soap ley. This paste must be put over all the parts of the horn, except such as are intended to be left transparent, to give it a nearer resemblance to tortoiseshell; the horn must remain in this state till the paste be quite dry, when it is to be rubbed off. It requires a considerable share of taste and judgment to dispose the paste in such a manner as to form a variety of transparent parts, of different magnitudes and figures, to look like nature. Some parts are, by a neat process, rendered semi-transparent, which is effected by mixing whiting with a part of the paste, to weaken its operation in particular places; by this means spots of a reddish-brown will be produced, so as greatly to increase the beauty of the

work. Horn, thus dyed, is manufactured into combs, and frequently sold for real tortoiseshell.

Many other modes of dyeing horn to resemble tortoiseshell have been described, but we do not deem it necessary to dwell upon them here.

Within a few years, *iron* has added to the number of its useful applications, by being employed as a material for combs. Small cheap combs are made of this metal, and then japanned or blackened by a subsequent process.

PROPAGATION OF PLANTS BY CUTTINGS IN WATER.

THE art of propagating plants by cuttings embraces a vast number of very interesting facts. The method to which we now solicit the attention of our amateur readers is despised by the professional gardener, as being beneath his skill and attention: nevertheless it will not be difficult to show that the instruction which it conveys, is in itself amply sufficient to rescue it from contempt, or rather to raise it high in the estimation of the lover of nature.

The three spring months comprise the period wherein cuttings succeed most freely; and for the reason, that they are then inclined to start into growth, and to obey the increasing stimulus of solar light; but they are not inactive during the summer, and many cuttings of the hard-wooded species prosper most, when they are placed in a cool situation, late in autumn. They thus retain their vital power during winter, gradually form a callus, or granulated mass, between the bark and wood, and finally develope roots, when gently excited by heat, in the early spring.

A cutting is prepared by passing a knife either through or close under a joint or leaf; and it almost invariably is found that, if a young shoot be slipped off the parent plant, and carefully trimmed at the heel, to remove asperities, and render the surface smooth, roots will be produced much more freely than they would be from any intermediate part; for a number of minute embryo buds exist round the base of a shoot or twig, just at the point of its junction with a larger branch. These buds or germs seem peculiarly inclined to protrude root processes, while those seated among the leaves of the upper part tend directly to expand into shoots. But when a cutting is fixed in the soil, whether it be in a pot or in the open ground, its progress is concealed, and can be only conjectured by the appearance of the part which remains above the surface. This forms one objection; another is found in the trouble which attends the plunging in heat, the covering with a hand or bell-glass, and the necessity of guarding against mouldiness or damping off, by frequently removing and wiping that glass. A cutting, when placed in a phial of water, may fail; it may also decay; but, if it is to succeed eventually, two circumstances will become obvious—first, it will not flag or droop, though no glass covering be put on it; and second, the water, however long the cutting remain over it, will show little, if any, tendency to become fetid and offensive. Every one must have remarked the extreme fetor acquired by water in which flowers are placed; therefore the contrast exhibited by the fluid in which a vegetating and growing plant remains during several weeks, exposed perhaps to the occasional heat of 95-100 degrees, is equally extraordinary and pleasing: there may be found exceptions; but they have not come under our notice, and we have had not a little experience for more than seven years.

It has long been an observed fact that the oleander (Nerium) will emit roots, if a young green shoot of it be placed in a small bottle of water, exposed to either the sun-heat of a window, or to the warm atmosphere of a hot-bed frame, or forcing-house. It frequently happens that a lively shoot, with the flower-buds becoming visible at its summit, will take root in a few weeks, and being then transferred to a pot of suitable earth, in heat, will retain and expand its flowers, forming a beautiful object in miniature.

The succulents root freely; so does the balsam. Of the last-named plant, specimens not eight inches high have been produced in a few weeks, with several expanded flowers, although the parent plant did not exhibit the slightest signs of coming into bloom. Small cuttings of the cucumber and melon, taken at the third joint from the summits, or indeed from any part of the plants, rarely fail to root in a few days; and we entertain little doubt that a stock of succession plants for the frames can thus be obtained more readily than by any ordinary process. Even single leaves protrude a mass of fibres, though it has not appeared that any latent bud became excited to form a shoot.

Among multitudes of examples we may cite the salvias—ruellia formosa, all the justicias which were subjected to trial, heliotropi, aloysia citriodora, alonsoa, petrenia, Thunbergiasturnera, as generally free-rooters. Dahlia is arbitrary, and so is crythrina christa-galli, or taurifolia; but they succeed after depositing masses of a species of parenchymatous matter. The Gesnereacea, particularly glexinia speciosa and candida, rarely fail. The careful observer will perceive in the two last a gradual convexity to form at the base of the cutting: it is the origin of the future tuberous mass, and, and from it small glittering fibres emerge, which appear like glass threads. Nothing can exceed the interest possessed by this charming object.

Among shrubs we have tried successfully gardenia, melastonia, pelargonium, the dark China rose, begonias Sutherlandia, coronilla, &c.

Not to dwell upon the instruction to be derived from the observation of processes which stand revealed to the eye, we do contend that as, in removing these rooted subjects from their fluid element, no injury is done to the slightest fibre or most delicate spongeole, a great object is attained; for the plants, if treated with any degree of skill and dexterity, strike off at once, and establish themselves in an appropriate soil with the least possible loss of time.

[From the *Morning Herald*.]

FLOWERS of plants removed from a hotter to a colder climate, disclose their flowers at a later hour. Thus, that which flowers in Senegal at six, will not unfold in France or England till eight or nine, and in Sweden, not till ten; and the flower that does not open in Africa till noon, or later, will not open in England at all.

TIME flies on in the same rapid course, and while we still trifle, Eternity is upon us. A gracious Providence calls upon us by the loudest alarms to hasten and finish our appointed work—and we carelessly devote our attention to objects undeserving the serious contemplation of a monkey. I do not call it trifling to enliven the circle of social good humour—to improve all our talents, small as well as great, to the praise of the giver,—thankfully to enjoy and admire even his least and most common bounties &c., but I have no patience with the false politeness of the world that banishes every subject that is interesting and delightful, if it bear but the name of seriousness.—TALBOT.

Of all the duties, the love of truth, with faith and constancy in it, ranks first and highest. Truth is God. To love God and to love truth are one and the same.—SILVIO PELLICO.

MECHANICAL POWERS.

No. II.

The Lever. (*Continued.*)

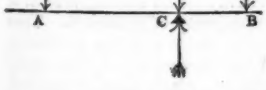
But, when the lever is used as a mechanical power, it is not always used merely to lift or balance weights. Instead of applying two weights to different parts of the lever, we apply a certain power to one part, in order to overcome a certain resistance which acts on another part. The power may be either that of a man or animal; or that of gravity acting on a weight, as in a clock; or the elasticity of a spring, as in a watch; or the force of the wind, or of a current of water, or the elasticity of steam. All such producers of power are called *prime movers*.

The resistance to be overcome may be the power of gravity, as when we want to lift a very heavy body; or that of inertia, or of friction, as when we wish to move a large body, which has naturally a tendency to remain at rest, called inertia, and whose motion is rendered difficult by its *friction*, or rubbing against the ground, or other body which supports it, as well as by the resistance of the medium through which it moves, as is the case with an oar, or wing, or paddle. At other times the resistance is that of cohesion, as when we want to cut, break, or grind a substance; in doing which we overcome the force with which the particles *cohere*, or hold together.

In all these cases, the power and resistance may be considered as two weights, and may be made to balance each other; or either may be made to preponderate, according to their distance from the centre of motion.

Of course the object always is, to make the power overcome the resistance; and, if the power be naturally stronger than the resistance, there will be no difficulty in effecting this. But if not, the power must be applied at a greater distance from the fulcrum, so as to move with greater rapidity, thereby possessing greater momentum or impulse. In the following figure A B represents a lever suspended from Z, or resting on its fulcrum at C. It is obviously of no importance whether it simply rests on a fixed point at C, or whether it is hung up at Z, or moves on a hinge or axis, as in fig. 2. P represents any power, as that of the hand, pushing the end A of the lever down; and R is the resistance to be overcome, or the weight to be lifted at B. Now it will always be found, that if the arm A C be longer than C B, a small power will be enabled to overcome a greater resistance; but if C B be the longer arm, the power will require to be much greater than the resistance, in order to balance or overcome it. In this figure, as the distance A C is twice as great as C B, any resistance at R will be balanced by half as much power at P; because the point A must move through a space twice as great as the point B does in the same time; so that it has twice the velocity, and consequently, although it is naturally a weaker power, yet its increased velocity gives it as great a momentum, or effective impulse, as the stronger power at R. If it were required to lift a weight of 1000 pounds at R, we need only press with a power of 500 pounds at P, in order to balance the 1000 pounds; and any power greater than 500 pounds would of course lift the 1000 pounds.

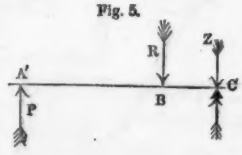
Fig. 4.



But nothing is actually gained by the lever; for *whatever is gained in power is lost in velocity*; and *whatever is gained in velocity is lost in power*:—a rule which applies not only to the lever, but to all the mechanical powers; and consequently to all combinations of them, that is, to all machinery. Thus, in the above instance, in order to move the 1000 pounds at R through one inch, or one foot, or one yard, as the case may be, we must move the 500 pounds at P through two inches, or two feet, or two yards. If we made the part A C sufficiently long, and the part C B sufficiently short, it would be very easy to overcome a resistance of 1,000,000 pounds by a power of only one ounce; but then in order to lift the 1,000,000 pounds one inch, the ounce must move through 16,000,000 inches. This consideration holds good in all machines that man can invent; and probably incited the celebrated Archimedes to aver, that he could move the earth from its place, if he could find a fulcrum for his lever: by which he intimated that the principle of the lever was of larger application than man was able to avail himself of.

But this is not the only manner in which the lever is used. There are two other modes of employing it. In the second kind of lever, the fulcrum is placed at one end, the power acts at the other end, and the resistance to be overcome acts at a point between them, as in the following figure, where P is the power, acting at A′, R the resistance, acting at B, and C the fulcrum. It will be observed that here, the power and resistance act in opposite directions, one tending to push the lever up and the other down; but as the power at A is furthest from the fulcrum C, suspended from Z, it describes a larger arc than the point B, and therefore this velocity at A′ makes the power P more effective. Hence velocity is diminished at B, but power is gained. In the first kind of lever power might be either gained or lost, according as the arm A C was longer or shorter than C B; but in the second kind there can never be a loss of power, because the distance A C must necessarily exceed B C, which is only a part of A C. In the figure, B C is only one-third of A C; and therefore the power P need be only one-third of the resistance R to be overcome. If the resistance R were applied at a point nearer to C, the gain of power at P would of course be greater. Thus if we try to raise one end of a form on which a person is sitting, we shall always find it easier if we apply our strength at the end furthest from that on which he is seated, than at the other end; because we then use the form as a lever of the second kind.

Fig. 5.



Whenever we wish to overcome a great resistance, we instinctively use a lever, either of the first or second kind, and nearly all the tools and instruments in daily use are of one of these sorts. In stirring a fire, the poker is a lever of the first kind; its fulcrum is the bar of the grate on which it rests; and the resistance to be overcome is the gravity or the compactness of the coals. In digging, after the spade has been thrust into the ground, it is generally used as a lever of the first kind, to lift and disturb the mass of earth in front of it; and accordingly this is more easily done when the spade is handled at the top than at any lower part; for the fulcrum is the earth behind the lower end of the spade.

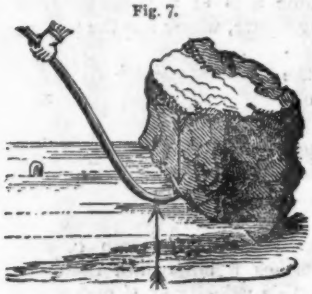
A lever need not necessarily be straight. For instance, when a nail is drawn by a clawed hammer, (as in fig. 6,) the hammer is a bent lever of the first kind, the fulcrum being at C, and the resistance being the adhesion of the nail N M to the wood, and acting at M Accordingly, the nail will be drawn with

greater ease by applying the power of the hand at A, than at any lower point; for the power gained is in proportion as the distance A C exceeds M C.

Fig. 6.

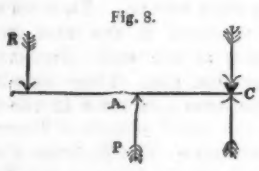
Whenever we raise or move one end of a body, the other end of which remains fixed, we use that body as a lever of the second kind; the resistance being the weight of the body itself. Thus every door and window-shutter is a lever of the second kind, the fulcrum being at the hinge; and of course the further from the hinge we apply our strength, the more easily will the door or shutter be shut or opened. A crow-bar is sometimes used as a lever of the first, and sometimes of the second kind. Sometimes it is rested on a small piece of wood or stone, as in the following figure, where the point of the arrow presents the fulcrum, the power is the hand, and the resistance the weight of the stone; which will of course be moved more easily in proportion as the hand is applied further up the crow-bar. In the other mode of using the crow-bar, it is slipped a little way under the weight to be moved, and the ground on which the lower end rests, serves as a fulcrum. The power is applied at the upper end, and the resistance acts at a point between them; and accordingly, it is found more easy to lift the weight of the stone, when the crow-bar is only slipped a little way under the stone, than when it passes further under.

Fig. 7.



The third kind of lever is that in which the fulcrum is at one end, as in the second kind; but the resistance acts at a point further off than the power, instead of being nearer. In the following figure, C is the fulcrum, P the power, acting at B, and R the resistance, acting against it at A. Here it is evident that there is a gain of velocity, but a loss of power at A; for the power has to move the resistance through a larger space than it describes itself; and whenever this is the case power is lost. Nevertheless, this mechanical power often operates in machinery, when the velocity has to be increased; and sometimes it is unavoidably used, as in lifting a ladder to or from a wall, which requires considerable strength, because that strength is used with so great a loss; for the ground is the fulcrum, the weight to be moved is the ladder itself, and the power of a man's arms is made to act at a point not more than five or six feet from the fulcrum, while the chief part of the ladder's weight lies considerably higher up. For the same reason, it is rather difficult to shut a door by applying your strength close to the hinge; for then you use the door as a lever of the third kind: but by applying your strength at the handle you make it a lever of the second kind; for the chief part of its weight lies between you and the hinge or fulcrum.

Fig. 8.



When the object of an instrument is to cut, break, or bruise substances, two levers are used which move on a common fulcrum, called a *joint*. The substance to be cut or crushed is placed between them, and the power is made to act at a point further from the fulcrum. A little reflection will soon satisfy the reader that scissors, shears, pincers, and snuffers, are double levers of the first kind, having the fulcrum between the power and the resistance; and therefore when used to cut very hard substances, they should have the handles much longer than the points. But nut-crackers are double levers of the second kind, in which the resistance is placed between the power and the fulcrum; and therefore the nut will be cracked more easily in proportion as it is placed nearer to the joint. Tongs, tweezers, and shears used in sheep-shearing, are double levers of the third kind; and it will be observed that such instruments are never used when there is much resistance to be overcome.

It was an excellent practice in Sparta to accustom their youth betimes to suffer heat and cold, hunger and thirst, and by several severe and laborious exercises to bring the body into subjection to reason, whose faithful and diligent minister it ought to be in the execution of all the orders and injunctions of reason, which it can never do, if unable to undergo hardships and fatigue.

We often use a *mental magnifying glass* to objects that are small and frivolous, and turn the wrong (or diminishing) end of the glass to those that are really great and important; this is the case of all worldly minded persons.

The Greeks despised and abjured the servile ceremonial of the Persian court, preferring to it the incessant turbulence of their own democracies; and the Romans held in a kind of superstitious abhorrence the title of king, even after they had bowed their necks with complacency to despotic power under the military title of Emperor. These popular fallacies of antiquity had not been detected and exposed, while they seemed to produce no bad effect; and the surface of ancient history had not then been penetrated by inquirers, who investigated the state of human society concealed under it. When ancient republics became sufficiently established to ensure the safe custody of the captive by walls and fetters, slavery came into use instead of indiscriminate slaughter of the vanquished enemy; and slaves, predial or domestic, soon constituted the majority of mankind. Thus the high-spirited patriots of antiquity, whom we assume as models of noble conduct, were all slave-holders, nationally or individually; and their patriotism, when closely examined, is found to be little else than an effort to obtain similar command over their equals by violence or treachery. So incessant were those attempts, that it is incidentally said, in the time of Alexander the Great, after he had humbled and pacified the Greek republics, that he restored to their homes 10,000 political exiles; many of whom, no doubt, had been whetting the dagger by which they hoped to be restored to their native cities, supported by domestic faction or foreign aid. Such were the strenuous patriots of classic Greece, such the hideous state of society infested by their cruelty and violence. Yet, such was the mighty influence of education, that at the commencement of the French revolution resistance against any settled government was deemed laudable, because, forsooth, government did not form an exception to all other human arrangements, by having attained to absolute perfection; and the experiment of bestowing power without responsibility, (the essence of all democracies), aggravated by its limited tenure, was tried in civilized France; with a result which suffered by comparison with the atrocity of ancient proscriptions, and dispelled the illusion of the ardent spirits of the age.—*Life of Thomas Telford.*

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